THE DEVELOPMENT AND TESTING OF A LEADERSHIP EFFECTIVENESS MODEL

John Hugh Quinlan

NAVAL POSTGRADUATE SCHOOL
Monterey, California

THESIS

THE DEVELOPMENT AND TESTING OF A
LEADERSHIP EFFECTIVENESS MODEL

by

John Hugh Quinlan

June 1974

Thesis Advisor: T. A. Wyatt

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE *(and Subtitle)* THE DEVELOPMENT AND TESTING OF A LEADERSHIP EFFECTIVENESS MODEL		5. TYPE OF REPORT & PERIOD COVERED Master's Thesis June 1974 6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) John Hugh Quinlan; Lieutenant, USN		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS Naval Postgraduate School Monterey, California 93940		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS Naval Postgraduate School Monterey, California 93940		12. REPORT DATE June 1974 13. NUMBER OF PAGES 79
14. MONITORING AGENCY NAME & ADDRESS*(if different from Controlling Office)* Naval Postgraduate School Monterey, California 93940		15. SECURITY CLASS. *(of this report)* Unclassified 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT *(of this Report)*

Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT *(of the abstract entered in Block 20, if different from Report)*

18. SUPPLEMENTARY NOTES

19. KEY WORDS *(Continue on reverse side if necessary and identify by block number)*

Leadership
Empathy
Consideration
Initiating Structure

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

A leadership effectiveness model was developed using a measure of empathy, two expressive measures of leadership and an index of leadership ability. The two expressive measures of leadership attitudes were "Consideration" and "Initiating Structure," taken from the Leadership Opinion

DD FORM 1 JAN 73 1473 (Page 1) EDITION OF 1 NOV 65 IS OBSOLETE S/N 0102-014-6601

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

Questionnaire. Sixty-four Naval officers were employed as subjects to test the leadership effectiveness model and the research hypothesis that those individuals high in leadership ability would be high in empathy, Consideration, and Initiating Structure. The statistical results of the research project appear to support the hypothesis. Those technically and administratively trained individuals who are in tune with the concerns of their subordinates thus appear to be more capable of effectively selecting the situationally correct means of guiding their subordinates and thus perform better in a leadership role.

The Development and Testing of a Leadership Effectiveness Model

by

John Hugh Quinlan
Lieutenant, United States Navy
B.S., United States Naval Academy, 1967

Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

from the

NAVAL POSTGRADUATE SCHOOL
June 1974

ABSTRACT

A leadership effectiveness model was developed using a measure of empathy, two expressive measures of leadership and an index of leadership ability. The two expressive measures of leadership attitudes were "Consideration" and "Initiating Structure," taken from the Leadership Opinion Questionnaire. Sixty-four Naval officers were employed as subjects to test the leadership effectiveness model and the research hypothesis that those individuals high in leadership ability would be high in empathy, Consideration, and Initiating Structure. The statistical results of the research project appear to support the hypothesis. Those technically and administratively trained individuals who are in tune with the concerns of their subordinates thus appear to be more capable of effectively selecting the situationally correct means of guiding their subordinates and thus perform better in a leadership role.

TABLE OF CONTENTS

I. INTRODUCTION

A. OVERVIEW AND PRESENTATION OF HYPOTHESIS

History has universally encouraged and rewarded effective leadership through an elaborate means of sanctions, acknowledgements and awards. Principalities, nations, governments, and corporate enterprises alike have placed vast resources at the disposal of those considered to be in possession of exceptional leadership skills in complete confidence that these men would effect the best possible results. It seems rather ironic then that this concept of effective leadership which is held so dear and historically rewarded so highly should be so poorly understood. From a strictly financial view, few investments could realize the return that research into the development of effective leaders could yield if, as a result, men could hone their leadership skills to such a degree as to significantly improve the functioning of their organizations.

Modern organizations give the implicit title of leader to those technically trained individuals whom they place in a managerial position and from whom they expect some measure of success. The degree of success which is obtained by the organization depends on many variables, among the most important is effective leadership.

This researcher has developed a pair of models, which are shown graphically in Figures 1 and 2, for the purpose

RECEIVER-TRANSMITTER MODEL

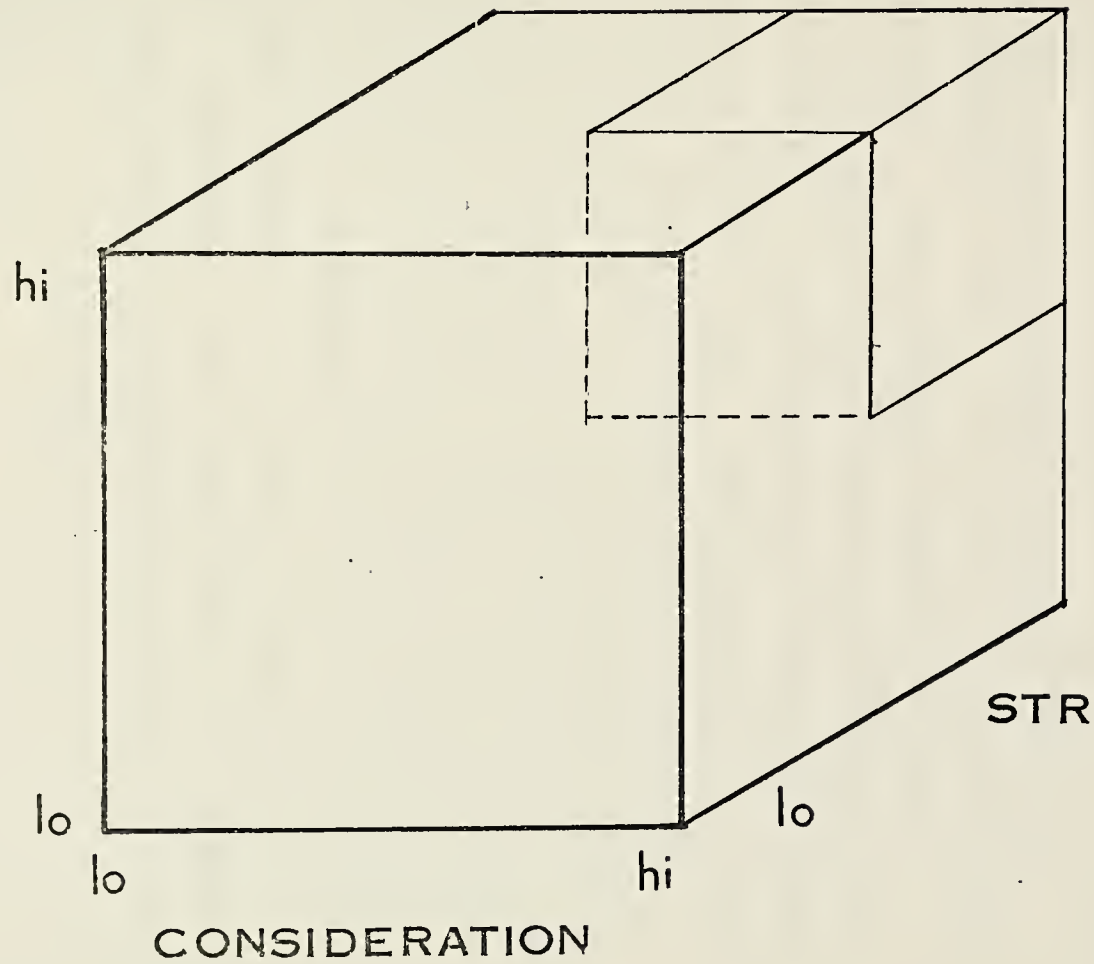
of investigating and discussing the concept of leadership. The first notion is that of individual manager reception and transmission of the available information necessary to the function of his task. The receiver consists of two elements, technical knowledge and empathy. Technical knowledge is an obvious necessity in any organizational situation and is the product of academic study and/or experience. High technical knowledge makes the reception of mechanical and administrative data inputs more effective. In a like manner, a high degree of empathy, " a sensitivity to the needs and values of others,"[1] makes the reception of human and interpersonal information more effective. These two elements complement each other and give the manager a broad picture of his environment. The clarity of that picture is a function of the sensitivity of these elements. The transmitter side of this individual model consists of two expressive measures of leadership behavior developed by Fleishman [27], "Consideration" and "Initiating Structure." It is through these reception-transmission elements that the manager determines the success of his leadership and thus the success of his task.

The second model, displayed in Figure 2, formulates graphically the hypothesis of the research project and is of greatest concern in this writing. It takes from the previous model the notions of receivers and transmitters in the

---

[1]Gnief, Ester Blank and Hogan, Robert, "The Theory and Measurement of Empathy," Journal of Counseling Psychology, v. 20, no. 3, p. 280, 1973.

LEADERSHIP EFFECTIVENESS MODEL



formation of a three dimensional figure. It is important to note that one of the receiver elements, technical knowledge, has been omitted here and will be considered equal in value for all individuals being considered in a particular management position. Although valuable in appreciating the receiver-transmitter model, it will not be evaluated in the research project. The leadership effectiveness model developed for testing in this research effort employs the elements of empathy, consideration and Initiating Structure as its three dimensional axes. The prime focus of the project is centered around individuals scoring high in all three of the measures for it is hypothesized that persons high in empathy, Consideration and Initiating Structure will also score high in leadership. That is, those individuals with good receivers in the form of technical knowledge and empathy, and good transmitters in the form of Consideration and Initiating Structure will be most effective in their position of leadership. This study measures the concepts of empathy, Consideration, Initiating Structure, and leadership in an endeavor to test the model.

B. LITERATURE REVIEW

1. The Early Leadership Studies

The concept of leadership has enjoyed a prominent place within managerial and psychological literature over the last forty years. In their earliest forms leadership studies were quite speculative and assumed a quasiphilosophical air. The failure of these early studies to produce

any meaningful results can be partially attributed to the lack of rigor employed by the armchair theorists and partially to a lack of inter-investigator agreement on definitions of the subject matter.

The first of these approaches to be attempted, and to fail, was initiated in the 1940's and entitled the "trait" approach. As mentioned earlier, a lack of interinvestigator agreement was a harbinger of this strategy's lack of success in developing a set of traits peculiar to and universally found within leaders. Stogdill [28] in a review of the pre 1948 literature found little encouraging agreement among investigators as to psychological, physical and personality traits. As pointed out by Gouldner [16] the trait approach failed primarily because the traits were poorly conceived, the measurements were crude and unreliable and most importantly, the traits were not possessed exclusively by leaders but by non-leaders as well.

The failure of the trait approach sired the development of the situation oriented approach. Tasks requiring varying degrees of involvement, training and leader-follower interaction were examined. Under this process, common situational elements were sought and attempts made to relate them to significant leader characteristics. Stogdill [28] emphasized that "the qualities, characteristics, and skills required in a leader are determined to a large extent by the demands of the situation in which he is to function as a

leader."[2] The situation oriented approach was relatively short lived as investigators soon realized that the number of unique situations requiring leadership was so vast as to preclude effective and relevant study by this means.

The third of these early approaches to the study of leadership is that centered around the follower. The assumption here was that the most effective leader is the one who best satisfies his followers needs. Although this aspect of the earliest studies was relatively insignificant in its own right it became a spring board from which the more rigorous studies began.

It became apparent that each of the facets described, the leader, the situation and the follower, are inextricable in any dynamic environment and must all be dealt with jointly. Sanford emphasized this in writing "to concentrate on any one of these facets of the problem represents over-simplification of an intricate phenomenon."[3]

2. Later Leadership Studies

To say that the early studies in leadership served no function would be unfair and definitely untrue. Although quasiphilosophical in nature and lacking in significant findings they did, as do all pioneer projects, begin to blaze the trail for later studies. As a result of the early

---

[2]Stogdill, R., "Personal Factors Associated with Leadership: A Review of the Literature," Journal of Psychology, v. 25, p. 63, 1948.

[3]Sanford, Fillmore H., Current Trends: Psychology in the World Emergency, University of Pittsburgh Press, p. 60, 1952.

studies, investigators now knew that the three facets of leadership could not be studied completely independently, that there was a need for more meaningful and universally accepted definitions and that there was a need to place more emphasis on the rigor of experimental and quasi-experimental design in their studies in order to produce more meaningful results.

A chronological break between what has been termed "early" and "later" studies in leadership does not exist in an absolute sense. Surely there were those during the early studies who preferred procedures that embraced the scientific method but their contribution did not become readily evident as their methods and tools were crude. In a similar manner, there are those investigators today who, despite the advances made in behavioral science to improve the validity and reliability of leadership studies, continue to employ one shot case studies and participant observation exclusively as their means of exploring and explaining the topic of leadership.

The number of investigators who have researched the topic of leadership in recent years and their contributions are varied and numerous. Undoubtedly one of the most prominent studies relevant to the present research project is the Ohio State University leadership studies (1946-1956). In these studies the approach was one of examining and measuring behavior of performance. This is by no means to be categorized with the trait approach which met with failure in

the early studies of leadership. Investigators of several disciplines were involved in the research project and had as a prime goal the investigation of the situational determination of leader behavior. There was no attempt made to study only "good" leadership but rather leadership in general. As a result of this extensive research project a variety of meaningful findings surfaced and no doubt the most significant of these was the identification of "Consideration" and "Initiating Structure" as cornerstones of leadership. These two elements, derived through factor-analytic procedures, were defined by Fleishman and Peters [24] in the following way:

> Initiating Structure (S): Reflects the extent to which individual is likely to define and structure his role and those of his subordinates toward goal attainment. A high score on this dimension characterizes individuals who play a more active role in directing group activities through planning, communicating information, scheduling, trying out new ideas, etc.
>
> Consideration (C): Reflects the extent to which an individual is likely to have job relationships characterized by mutual trust, respect for subordinates ideas, and consideration of their feelings. A high score is indicative of a climate of good rapport and two way communication. A low score indicates the supervisor is likely to be more impersonal in his relations with group members.

The measurement instruments developed for these two dimensions were the Leadership Opinion Questionnaire and the Leader Behavior Description Questionnaire. The Leadership Opinion Questionnaire is a Likert type attitude scale for the assessment of leadership attitudes. The respondant is not asked how he actually performs within the work group but rather how he believes he should perform. In the Leader Behavior Description Questionnaire, the measurement is of subordinate perception of supervisory behavior. It should be noted at this time that "Consideration" and "Initiating Structure" are not elements of a constant-sum concept, in that a high score in one aspect necessitates a low score in the other, but rather any combination of high and low scores on the respective scales of the LOQ and LBDG are possible.

In examining the results of the LOQ test, which is of primary interest in this research project, Fleishman discovered good reliability in both test-retest and internal consistency. In ten samples, varying in size from 46 to 394, he discovered a rather striking independence of the two scales (C) and (S). This was true for all samples except for two samples of Naval Officer Candidates ($N = 247$; $N = 274$) where there was a negative correlation ($r = -.23$; $r = -.21$ respectively) at the .01 level of significance. This slight tendency to associate high "Consideration" with low "Initiating Structure" is worthy of note due to the sample frame from which the sample for this research is drawn.

The validity of the LOQ was of considerable interest to Fleishman, as is the case with all instrument designers. Although a few statistically significant correlations were found between the LOQ and independent leadership measures such as peer ratings, merit ratings by supervisor, force choice performance reports by management and leaderless group situation tests, most of the correlations were essentially zero. As a result of these validity checks, a need for a more industrial criterion was indicated. These low correlations however, certainly did not entirely negate the value of the LOQ dimensions, but rather indicate a need for further investigation. Korman [24] in a review of the literature on "Consideration" and "Initiating Structure" tabulated extensive lists of criterion and their correlations with the (C) and (S) scales of the LOQ and LBDQ. In nearly all of the instances, the correlations were predominantly low to moderate and almost all of concurrent validity. Korman is quick to point out a lack of predictive validity of the instruments but does recognize the existence of situational moderators which might affect validity. This acknowledgement of situational moderators and their interaction with "Consideration" and "Initiating Structure" is significant in the development of this research project.

Yukl [30] added decision-centralization to the leader behavior dimensions of "Consideration" and "Initiating Structure" based on his personal findings which indicated a need to redefine the parameters of Consideration by adding another

variable. This third dimension refers to the degree to which a leader permits subordinate participation in decision making. He conceived this additional scale in the development of a discrepancy model of subordinate satisfaction with the leader and a multiple linkage model of leader effectiveness. Although no instruments for measurement were advance by Yukl nor supportive empirical data included, the derivation of both models is conceptually sound and agrees strongly with current research and literature. Of particular worth is the attempt to identify the situational moderators which Korman recognized as being necessary in the establishment of predictive validity.

In a literature review following his model descriptions, Yukl described the work of others who had endeavored to correlate "Consideration," "Initiating Structure" and productivity. From an extensive and impressive list of research projects he was able to make the following conclusions:

a) research relating "Consideration" and productivity does not yield consistent results. In many studies there was either a high positive correlation or no significant linear relation.

b) research relating "Initiating Structure" and productivity also does not yield consistent results. In some studies a significant positive correlation was found while in others none was found. There was however, no evidence of a significant negative correlation reported.

c) research relating "Consideration," "Initiating Structure" and productivity jointly showed that leaders who rated highly in both the (C) and (S) scales had the most productive groups.

These findings are especially relevant to the current research project as the elements of "Consideration" and "Initiating Structure" jointly are of great concern.

3. Development of Empathy Studies

While the concept of leadership (its definition and measurement) was occupying the attentions of many social researchers, investigators of similar disciplines were independently undertaking research into the theory and measurement of empathy. As was the case with "leadership," early empathy research suffered from a lack of adequate definitions and methodologically sound tools. In an attempt to be more rigorous in their examination of the concept, researchers in the late 1940's began to develop instruments to measure this ability to adapt the role of another or view the world through another's eyes. It was quickly recognized that a valid and reliable empathy measure would serve a number of practical and theoretical purposes.

One of the first to develop a measure of empathetic ability was Dymond [8, 9, and 10] who employed a series of rating forms. This cumbersome method was quickly questioned on methodological grounds by Hastorf and Bender [20]. The Empathy Test [23] was questioned as to validity by Thorndike [29] and Hall [18]. Hall and Bell [19] conducted a cross

validity check of the Dymond and Kerr empathy measures and found a near zero correlation indicating that while both tests may have been measuring something, as indicated by original validity studies, they were not measuring the same thing. The implications of this research indicated that one or both of the instruments was not measuring empathy and that a more satisfactory definition was needed. Cassell [6] developed the Test of Social Insight which appeared useful but reviewers Bordin [5] and Black [4] have challenged the validity of the instrument to measure empathetic or perceptive capacity for understanding others.

Hastorf and Bender [20] in an early review and critique of the literature on empathy, emphasized the fact that "successful prediction of anothers response may be due to projection rather than empathy when it is defined as "transposing oneself into the thinking, feeling and acting of another and so structuring the world as he does." This realization by Hastorf and Bender sent the empathy research community into a conceptual frenzy which resulted in such writings as Gage and Cronbach's [12] conceptualization of the following: real and assumed similarity, warranted and unwarranted assumed similarity, warranted and unwarranted assumed dissimilarity and accuracy (a combination of warranted assumed similarity and warranted assumed dissimilarity). Cronbach [7] continued in this vein to identify conceptually the elements of elevation, differential elevation, stereotype accuracy and differential accuracy in an

effort to further identify the components of empathy. Although rigorous in format and heavily laden with significant conceptualizations and lengthy formulas, these articles offer little to the area of practical application. Acting under the assumption that simple operationally defined measures are of no value, and in an attempt to subdivide the global measure of empathy in order to further understand the phenomenon being observed, the investigators have made some deep and penetrating slices into the concept. This action was taken under the preconceived notion that the whole is always equal to the sum of its parts.

Hatch [21] in his published doctoral dissertation employed the Forced-Choice Differential Accuracy Approach in an attempt to deal with the problems as identified by earlier investigators such as Gage, Crobach, Hastorf and Bender but did not endeavor to correlate empathetic sensitivity as measured by his scale and any outside criterion variables. Hatch [21] was unsuccessful in his attempts to differentiate successful and unsuccessful managers as rated by superiors on human relations skills.

In the wake of this strong fifteen year emphasis on the fads and fashions of empathy testing, recent investigators have taken a long look at the process by which empathetic ability was being measured. This enterprise has resulted in a renewed effort to measure the concept of empathy as a whole instead of a laboratory specimen for dissection. Gough [14] conducted research on the Chapin Social Insight

Test, a measure long ago discarded by researchers, and presented new evidence for its validity. Hogan [22], following in a similar manner, developed an Empathy Scale with apparently good reliability and validity.

This reversal in the trend toward the use of increasingly complicated mathematical formulas in the measurement process has not been universal within the social sciences, but rather peculiar to the concept of empathy. The scale developed by Chapin in 1942 and that developed by Hogan in 1969, although admittedly imperfect, are now of renewed interest in the research of empathy. The Hogan Empathy Scale will be one of the primary instruments of this research project.

The independent research efforts into the concepts of leadership and empathy have made significant advances in recent years. Most noteworthy in the area of leadership is the recognition of its dynamic nature, an absolute necessity in a realistic appraisal of the phenomenon. Concurrently empathy studies seem to have advanced through regression and a return to more fundamental measures of the concepts. It is the intent of this researcher to integrate the concept of empathy into a leadership effectiveness model for the purpose of examining its compatability with the Consideration and Initiating Structure concepts of the Leadership Opinion Questionnaire.

II. METHODOLOGY

A. THE SAMPLE

The testing sample consisted of 64 naval officers assigned to the Naval Postgraduate School and tenant commands in the Monterey, California area. Within the sample were 51 male and 13 female officers. The sample consisted primarily of middle range officers of the rank lieutenant through commander with three female ensigns and one female lieutenant (junior grade) also particiapting in the testing. The mean age for the male participants was 33.8 and that for the female participants was 29.1. All participants were caucasian.

B. DESIGN OF DATA COLLECTION

The data was collected by administering the test instruments to volunteer Ss in two testing sessions. In the first session 39 Ss participated and in the second session 25 Ss participated. Although the testing rooms were not identical (one being a small lecture hall and the other a classroom), the time of day of test administration, the lighting conditions, the noise level in the test room, the pretest administration, the relative physical comfort of the Ss and the proximity to events such as final or mid term exam schedules were very similar.

It is readily acknowledged that all Ss were volunteers and that this fact somewhat biases the data in eliminating

from the sample those potential Ss not willing to be tested. The Ss were, however, emphatically assured of the confidentiality of their individual responses and scores.

Each participant was given materials for the California Psychological Inventory (CPI), the Leadership Opinion Questionnaire (LOQ) and a sheet labeled "Additional CPI Items." This final sheet contained 17 items from the Minnesota Multiphasic Personality Inventory (MMPI) and 8 items from testing devices from the Institute of Personality Assessment and Research, University of California, Berkeley (IPAR). Of the three instruments, the CPI is the most extensive and time consuming. Its 480 items take 75 minutes on the average, to complete. The LOQ and the "Additional CPI Items" contained 40 and 25 items respectively and took much less time to complete. A pre-study conducted prior to the administration of the two testing sessions and including none of the eventual Ss from whom data would be gathered indicated an average completion time of 8 minutes for the LOQ and 5 minutes for the "Additional CPI Items." Based on these pre-study findings, participants were instructed that they may complete the CPI, LOQ, and the "Additional CPI Items" in any order that they desired. Because of the relatively short completion times for the LOQ and "Additional CPI Items" compared to that of the CPI, no fear of response set was warranted and thus no need for dividing the group into separate sections and administering the tests in varied sequences was indicated.

Upon completion of the testing session, the Ss returned the materials to the researcher and left the testing area. Upon turning in the materials, the researcher informed each of the Ss that they would have CPI and LOQ results mailed to them within a week. This was accomplished. Each participant received his own results, the mean results of the groups tested, an explanation of some of the basic concepts involved in the tests, and a list of references from which further individual test analysis could be made.

C. INSTRUMENTS

To review briefly the three instruments employed in the research testing were the Leadership Opinion Questionnaire, the Hogan Empathy Scale and the Gough Leadership Index.

1. Leadership Opinion Questionnaire

The Leadership Opinion Questionnaire (LOQ), discussed in the literature review, contributed two variables to the research data, "Consideration" and "Initiating Structure." These two expressive variables were previously defined in this writing reflecting "the extent to which an individual is likely to have job relationships characterized by mutual trust, respect for subordinate's ideas, and consideration of their feelings" and reflecting "the extent to which an individual is likely to define and structure his role and those of his subordinates toward goal attainment," respectively. Since its development during the Ohio State Leadership Studies (1946-1956), the Leadership Opinion Questionnaire [27] has been extensively examined and fruitfully employed

by social researchers in a variety of projects. Bass [2 and 3] used the LOQ in two studies endeavoring to forecast supervisory success. Ashour and England [1] investigated subordinates assigned level of discretion and utilized the LOQ in assessing leaders willingness to delegate authority. Yukl [30] extracted the concepts of "Consideration and Initiating Structure" and included them in the design of his multiple linkage model of leader effectiveness. Newport [25] conducted a study of Air Force Reserve Officers and administered the LOQ, dividing the resulting scores on the two scales into high and low categories. He then conducted an analysis of extremes, i.e. investigating attitudinal variables common to those respondents scoring equally high or equally low on both scales. Korman [24] made an extensive review of all pre-1966 studies employing the LOQ, exclusive of those directed toward the evaluation of Consideration and Initiating Structure as dependent variables in training, and offers the results in concise table format. These expansive tables showed low to moderate correlations between Consideration, Initiating Structure and various organizational criteria. Almost all of these were of concurrent validity in nature. Fleishman [11] offers as references in the "Manual for Leaders in Opinion Questionnaire" an extensive listing, far surpassing Korman's, of investigators employing the LOQ as a measurement device in social research in a variety of situations and for a variety of purposes. The results of these independent researchers have been quite

encouraging. In nearly every project undertaken the Consideration scale has been markedly more sensitive and significant than the Initiating Structure scale. The two components of the LOQ, however, have been of great value to researchers in jointly performing such tasks as predicting plant effectiveness, hospital performance and risk taking of managers.

It is by no means this researcher's contention that the LOQ is a valid or reliable instrument merely by virtue of its history of extensive useage. The interest is, however, to demonstrate that the LOQ's contributions are worthy of attention.

a. LOQ Reliability, Validity and Correlation with Other Measures

As mentioned in the literature review, the LOQ has excellent reliability as measured by test-retest and split half internal consistency methods. Table I [11] shows the results of eight representative samples. In each instance the results are obviously excellent for both scales.

The LOQ was developed to maximize construct validity using factor analysis and item analysis. Factor analysis enabled Fleischman to eliminate two of the original keys, "Production Emphasis" and "Social Sensitivity," from the initial test as their reliabilities were low. Item analysis enabled Fleischman to divide evenly the number of items to be employed between the two scales. Summary tables of LOQ validities with an extensive list of criteria are listed by Korman [24] and Fleishman [11]. Many high and

TABLE I

RELIABILITY ESTIMATES OF THE LOQ

N	Sample	C	S
122	First-line supervisors	.70*	.79*
202	ROTC cadets	.80*	.82*
394	Manufacturing employees	.89*	.88*
120	Executives	.62*	.80*
31	First-line supervisors	.80**	.74**
24	Air Force NCOs	.77**	.67**
80	Foremen in a pharmaceutical company	.70*	.69*
90	Supervisor applicants in Swedish company	.74*	.82*

*Split-half
**Test/retest

significant correlations are in evidence but the pattern does not extend to all organizational criteria and settings.

A final point worthy of mention is the LOQ's relationship to intelligence and personality measures. Here, the LOQ avoids a common failing of many questionnaires in that it is definitely independent of any intelligence measure. Table II [11] shows clearly the existence and predominance of these near zero correlations. The LOQ as mentioned earlier, has been employed extensively in social research in conjunction with personality measures and thus a substantial amount of evidence exists correlating the two scales of the LOQ and these various personality measure. Fleishman [11]

TABLE II

CORRELATIONS OF THE LOQ SCALES
WITH MEASURES OF INTELLIGENCE

Measure	Sample	N	C	S
3 yr. grade point avg.	ROTC Cadets	145	-.13	-.04
ACE Quantitative plus Language Score	ROTC Cadets	145	-.16	-.13
Navy Verbal-Numerical Test	Navy OCs	247	.04	.04
Navy Verbal-Numerical Test	Navy OCs	274	.08	-.01
Midterm academic avg.	Navy OCs	247	.05	-.02
Wonderlic	Bakery Supervisors	80	.19	.00
Scholastic Ability Test	Middle Managers	493		
Total			-.02	.00
Quantitative			-.02	-.03
Verbal			.00	-.06
Otis Mental Ability Test	Managers (all levels)	102	.00	-.18
Otis Mental Ability Test	Managers (first-line)	84	-.08	-.24

lists an impressive number of such correlations in which it is clear that the LOQ is measuring something unmeasured by other personality measures. Where significant correlations do exist, however, they are quite obviously within the conceptual domain of leadership.

2. Hogan Empathy Scale

The Hogan Empathy Scale, also addressed in the literature review of this research project, was the second

measurement device employed. Developed by use of the standard technique of item analysis, the Empathy Scale resulted in a sixty-four item instrument [17 and 22]. Of the sixty-four items, thirty-nine are scored from the California Psychological Inventory (CPI), seventeen are scored from the Minnesota Multiphasic Personality Inventory (MMPI) and eight are scored from the Institute of Personality Assessment and Research (IPAR) testing devices. The twenty-five items from the MMPI and the IPAR devices were given the name "Additional CPI Items" within this research project for ease of administration within testing sessions.

a. Hogan Empathy Scale Reliability, Validity and Correlation with Other Measures

Hogan [22] provides evidence of two distinct reliability tests in advancing his recently developed scale. First, with a group of 50 college undergraduates in a two month test-retest study a correlation of .84 was found. Secondly, applying the KR-21 formula to the results of 100 military officers gave a correlation of .71. Both measures indicate good reliability for this young instrument.

In a similar manner, Hogan [22] establishes significant concurrent validity. Through correlations with Q-sort derived empathy ratings and teacher evaluation of the most and least socially acute students, Hogan has discovered correlations as high as .62 with the Empathy Scale. These results are very encouraging in the light of the failures of other recent extremist research efforts to measure empathy

by conceptually slicing it to shreds and converting everything to a multivariable exponential equation.

There exists a good number of high and significant correlations in the review of correlations between the Hogan Empathy Scale and numerous and varied personality measures. For example, Hogan [22] lists in Table III, high correlations between the Empathy Scale and several well known tests, and scales of these tests, for various groups studied. The existence of these high correlations does by no means indicate that the Hogan Empathy Scale is merely a redundant measure of any one of the previously established instruments. It does, however, plainly demonstrate that the quality being measured by the Hogan Empathy Scale is also related to many other diverse characteristics.

TABLE III

CORRELATIONS BETWEEN HOGAN EMPATHY SCALE AND OTHER PERSONALITY MEASURES

Test Scale	r	p (when available)
Maudsley Personality Inventory		
(Neuroticism)	-.28	.05
(Extroversion)	.51	.01
Myer-Buggs Type Indicator		
(Extroversion	.63	.01
(Introversion)	-.61	.01
California F-Scale (Male Sample)	-.52	
California F-Scale (Female Sample)	-.30	
Dogmatism Scale (Male Sample)	-.31	

3. Gough Leadership Index

The Gough Leadership Index is also a relatively young instrument. It was developed by Harrison G. Gough, author of the California Psychological Inventory (CPI) and derived through a multiple step wise regression of the CPI.

In the development of the Gough Leadership Index, ninety male and eighty-nine female students were nominated by participating principals of fifteen high schools as possessing outstanding leadership qualities. The total male and female sample sizes were 1,532 and 1,830 students respectively. Resulting scores on the CPI revealed that those males and females nominated as leaders scored significantly higher ($p \leq .01$) on seventeen of the eighteen scales and eleven of the eighteen scales respectively than did the remaining samples. The multiple step wise regression was performed and results restricted to the best five variables. The following equation is the result of that regression [13]: Leadership = 14.130 + 372 Do + .696 Sa + .345 Wb - .133 Gi + .274 Ai. In this equation the abbreviations Do, Sa, Wb, Gi, and Ai represent the CPI scales Dominance, Self-Acceptance, Well Being, Good Impression and Achievement via Independence respectively.

a. Gough Leadership Index Reliability, Validity, and Correlation with Other Measures

The reliability of the Gough Leadership Index is quite easily presented by virtue of its source, the CPI. Having established an admirable record in social research, the CPI has been tested and utilized by many engaged in

serious social research and thus voluminous data is available on the results. Gough [15] provides the results of three test-retest correlations in an extensive table. For simplicity Gough's presentation has been reduced in this writing to include only those scales germane to the Leadership Index and is displayed in Table IV. The consistently high correlations give significant merit to the Index.

TABLE IV

CPI TEST-RETEST CORRELATIONS OF GOUGH LEADERSHIP INDEX SCALES

Scale	High School Females (N=125)	High School Males (N=101)	Prison Inmates (N=200)
Do	.72	.64	.80
Sa	.71	.67	.71
Wb	.72	.71	.75
Gi	.68	.69	.81
Ai	.57	.63	.71

Gough [13] conducted two validity tests of the Leadership Index. In a cross-validation using 164 college students the mean index score for those identified as "high" on leadership was 56.65 (SD=5.04), for those identified as in the middle category on leadership the mean was 54.93 (SD=4.79) and for those identified as "low" in leadership the mean was 51.69 (SD=4.64). Those scores resulted in a correlation of .34 at the .01 level of significance between

the leadership index and the pretest subjective ratings. In a second validity check using the same sample, it was determined that 50.0% of those subjectively selected as being "high" in leadership had scores above 58, that 40.7% of those selected as in the "middle" category of leadership had scores between 52 and 57, and 57.1% of those identified as "low" in leadership scored below 52. Quick reference to the means and standard deviations listed earlier for this test group makes the selectivity and value of this new leadership measure readily apparent.

As was the case in the area of test reliability, the Gough Leadership Index's correlation with other measures has been extensively researched in its parent instrument, the CPI. Gough [15] provides expansive tables in the California Psychological Inventory Manual of numerous interscale and interinstrument correlations. Table V is a modification of two such arrays correlating the five CPI scales contained in the Gough Leadership Index with five measures of intellectual functioning and five measures of social activity. Although most of the correlations are quite low, those which are high are in conceptually related areas and are in part measuring similar qualities.

Due to the relative newness of the Gough Leadership Index, an extensive table of correlations between it and other personality, social, and intelligence measures is not available to be included in this writing. A start in

TABLE V

CORRELATIONS OF GOUGH LEADERSHIP INDEX SCALES WITH MEASURES OF INTELLECTUAL FUNCTIONING AND SOCIAL ACTIVITY

	Do	Sa	Wb	Gi	Ai
Coop General Culture Test (N=152 males)	.13	.30	-.08	-.26	.40
General Information Survey (N=100 males)	.27	.22	-.19	-.06	.47
Guilford Creativity Battery (N=100 males)	.45	.35	-.19	-.13	.19
Terman Concept Mastery Test (N=100 males)	.32	.11	.16	.17	.53
Wesman Personnel Classification Test (N=100 males)	.29	.12	.19	.07	.41
Chapin Social Insight Test (N=100 males)	.12	-.04	.08	.10	.30
Cline Social Activity Movies (N=100)	.19	.21	.11	.06	.15
Gough Opinion Prediction Scale (N=100 males)	-.01	.10	.11	.03	.07
Kerr Empathy Test (N=100 males)	-.06	.01	.06	-.10	.14
Remmers-File "How Supervise?" (N=100 males)	.48	.42	.14	-.29	.46

the compilation of such a matrix will be one of the fruits of this research project.

4. Instrument Inter-relationships

In previous pages the three research instruments have been addressed individually as to origin, reliability, validity, and relationship to other measures. Of interest now, is a consolidated representation of inter-instrument relationships known to exist between the measures, indexes and scales at the outset of this research. Table VI presents an overview of these relationships. As can be seen in this table there existed correlations between only two of the possible six combinations of measures. This is by no means surprising due to the relatively recent publication of both the Hogan Empathy Scale and the Gough Leadership Index. The two instances in which some data is available on interrelationships will be discussed in the following paragraphs.

Table VII, as noted in Table VI lists the correlations between Hogan Empathy Scale scores and the scales of the CPI the parent instrument of the Gough Leadership Index. All eighteen scales are included for the purpose of showing the correlations existing between the Hogan Empathy Scale and those scales on the CPI employed in the Gough Leadership Index (Dominance, Self-Acceptance, Well being, Good Impression and Achievement via Independence) as well as those scales of the CPI not employed in the Gough Leadership Index. Correlations between the Empathy Scale and the Leadership Index were not found in an exhaustive literature review.

TABLE VI

PRERESEARCH MATRIX OF KNOWN INTERVARIABLE RELATIONSHIPS

	Hogan Empathy Scale	Gough Leadership Index	LOQ Consideration Scale	LOQ Structure Scale
Hogan Empathy Scale		Some correlation between Hogan and individual CPI scales of Gough (a)	No published Relationships	No published Relationships
Gough Leadership Index			No published Relationships	No published Relationships
LOQ Consideration Scale				Low correlations (b)
LOQ Structure Scale				

(a) See Table VII for a complete listing of correlations.
(b) See Table VIII for interscore correlations of seventeen samples.

TABLE VII

CORRELATIONS BETWEEN EMPATHY SCALE SCORES AND SELECTED VARIABLES

Test and Scale	Group A[1]	Group B[2]
CPI		
1) Dominance (a)	.48**	.56**
2) Capacity for status	.62**	.51**
3) Sociability	.58**	.56**
4) Social Presence	.56**	.60**
5) Self Acceptance (a)	.34**	.51**
6) Well Being (a)	.19	.11
7) Responsibility	.11	.27*
8) Socialization	.05	-.01
9) Self Control	-.04	-.11
10) Tolerance	.42**	.33*
11) Good Impression (a)	.34**	.07
12) Communality	.00	.05
13) Achievement-Conformance	.30**	.23
14) Achievement-Independence (a)	.27*	.17
15) Intellectual Efficiency	.52**	.32*
16) Psychological Mindedness	.16	.46**
17) Flexibility	.23*	.29*
18) Feminity	-.04	-.18

[1]Group A = 70 medical school applicants

[2]Group B = 51 female college seniors

* $p \leq .05$

** $p \leq .01$

a. Variable employed in the Gough Leadership Index

Table VII however, does reveal two important factors. First, the Empathy Scale has its highest correlations with items 1 through 5, which are measures of social effectiveness and functional intelligence. These measures are well in line with the concept of empathy and compliment its understanding. Secondly, the table indicates that there exists some measure of relationship between empathy and the individual elements of the linear leadership regression equation but that they are measuring different facets.

Table VIII displays the correlations between the two scales of the LOQ. As is readily apparent, there is a near zero and insignificant correlation in nearly every sample. The independence of these two scales is of considerable importance in this writing.

At this point it is necessary to bring to light and acknowledge the existence of a possible cause for concern by future researchers. Within the Hogan Empathy Scale and the Gough Leadership Index there exist sixteen common items. Of this number, eight are scored alike (i.e., have the same "correct" response) and eight are scored oppositely (i.e., an answer marked true will improve one score while not improving the other). A complete list of these common items can be seen in Table IX. When reviewing Table IX it is necessary to remember that Gi (Good Impression) has a negative loading in the Gough Leadership Index and thus those common Gi items which appear to be enhancing both scores by virtue of their like answers are in reality having an opposite effect on the two scales and are thus considered to be

TABLE VIII

CORRELATIONS BETWEEN CONSIDERATION AND STRUCTURE SCORES FOR VARIOUS SAMPLES

N	Sample	r
122	First Line Industrial Supervisors	-.01
46	First Line Industrial Supervisors	-.07
22	Top Executives	.03
80	Bakery Supervisors	-.19
202	ROTC Cadets	-.19
247	Naval Officer Candidates	-.23
274	Naval Officer Candidates	-.21
47	Air Force NCO's	.02
47	Air Force NCO's	.08
394	Industrial Employees	.04
60	General Foremen	-.23
100	College Seniors	-.05
59	Utility Supervisors	.05
80	Pharmaceutical Foremen	.10
21	Chemical Supervisors	.06
57	Motor Trucking Production Foremen	-.33
75	Swedish Supervisory Candidates	.16

** $p \leq .01$

TABLE IX

HOGAN EMPATHY SCALE/GOUGH LEADERSHIP INDEX COMMON ITEMS

CPI Question Number	Hogan Empathy Scoring	Gough Leadership Scoring and Scale Abbreviation
8	T	T (Ai)
52	T	F (Ai)
81	F	F (Gi)
86	T	T (Sa)
91	F	F (Gi)
122	T	T (Ai)
127	T	T (Gi)
130	T	F (Ai)
191	T	F (Wb)
198	T	T (Sa)
247	F	T (Sa)
255	F	F (Ai)
275	T	T (Sa); F (Gi)
359	T	T (Do)
364	F	T (Do)
403	T	T (Do)

T = True

F = False

Ai: Achievement via Independence
Gi: Good Impression
Wb: Well Being
Do: Dominance
Sa: Self Acceptance

scored oppositely. A relative frequency distribution of like and oppositely scored items with the Gough Leadership Index weighting follows:

Scale/weighting on Leadership Index	# of like occurrences	# of opposite occurrences
Do (.372)	2	1
Sa (.696)	3	1
Wb (.345)	0	1
Gi (.133)	1	3
Ai (.274)	3	2
Total frequency	9	8

There is a near equal number of like and opposite scoring occurrences and the net result on the Hogan Empathy Scale is to either raise or lower the score by the value ± 1.0 (i.e., 9 like responses less 8 opposite responses = 1 response). Because of the individual factor loadings the net effect on the Gough Leadership Index is not quite as simply calculated. Multiplying the factor weightings by difference in like and opposite occurrences, however, reveals that the maximum possible effect on this index is ± 1.427.

A near equal number of like and oppositely scored items on the two instruments has a negating effect and thus an extremely small and insignificant effect on interinstrument correlations.

D. ANALYSIS

The primary goal of this research effort was to test the leadership effectiveness model developed earlier in the writing. Of secondary interest was a thorough investigation gation of the relationships existing between the individual scales and indices used.

These goals were met through a series of multiple step wise regressions, analysis of variance and Pearson correlations employing the Statistical Package for Social Sciences on the Naval Postgraduate School IBM 360-67 computer.

Throughout the following chapters, the terms high leadership, high empathy, high Consideration and high Structure will be used extensively. In each case these terms are to be interpreted as high scores on each of the respective scales or indices. These definitions are made in the interest of brevity and ease of reading.

III. FINDINGS

A. MEASURE BY MEASURE RESULTS

Tables I through IV of Appendix A give the basic statistical output for each of the four scales/indices employed in this research project. Each table shows the absolute, relative and cumulative frequencies for each variable as well as the mean, mode, median and standard deviation. The wide range of scores obtained from the sixty-four Ss on the four scales shows the selectivity of the instruments.

Table I of Appendix A shows the results of the Consideration scores on the LOQ. With a maximum possible score of eighty on this measure, the range of twenty-nine in a sample size of sixty-four is most promising. As can be seen in the table, the mean score was 52.875 with a standard deviation of 6.153.

Table II of Appendix A shows the results of the second measure of the Leadership Opinion Questionnaire, Initiating Structure. Here again the maximum possible score was eighty and thus a range of twenty-seven is worthy of note. The mean score on Initiating Structure for the sixty-four Ss was 48.453 with a standard deviation of 5.963.

Table III of Appendix A displays the statistical results of the third measure, the Hogan Empathy Scale. The maximum possible score on this instrument was sixty-four and again a statistically healthy range of twenty is evident. The mean

score on the Hogan Empathy Scale for the sixty-four Ss was 39.016 with a standard deviation of 5.242.

Table IV of Appendix A gives the statistical results of the final measure, the Gough Leadership Index. Because of the weighted means by which the index is calculated, few Ss received the same score. In this research project only two Ss matched scores. The mean score on this index was 58.808 with a standard deviation of 4.916.

B. GROUPED EFFECT OF MEASURES

The individual results of the four measures employed in this research effort are merely a matter of secondary curiosity. The prime interest is an analysis of their grouped effect. It is through the analysis of the grouped effect empathy, Consideration, Initiating Structure and leadership that the hypothesis is tested. In an effort to best observe these group relationships, multiple step-wise regressions and Pearson correlations were conducted on four systematically determined data groupings. These four groups were raw data, raw data trichotimized into high, medium and low leaderships scores, Ss scoring greater than the mean on the leadership scale and Ss scoring greater than one standard deviation above the mean on the leadership index. Each of the four phases of data analysis provide a unique view of the grouped effect of the research measures.

1. Analysis of Raw Data

A Multiple stepwise regression using the Gough Leadership Index as the dependent variables and a series of

Pearsons correlations were run on the raw data. The signigicant results are compiled into Tables X and XI.

The resulting equation from this multiple stepwise regression is: $L = .57314(E) + .09961(S) - .07609(C) + 35.64358$.

L = Gough Leadership Index

E = Hogan Empathy Scale

S = Initiating Structure Scale on LOQ

C = Consideration Scale on LOQ

Table X displays the weighting factors for each variable and gives an individual F statistic for each. The high F statistic and weighting factor for empathy shows that empathy explains a great deal of leadership with a high degree of significance. Structure and Consideration, however, add little to the empathy variable in the explanation of leadership.

The second major data manipulation was a series of Pearson correlations conducted on the raw data. Table XI displays the intervariable correlations for all possible combinations of instruments. The table shows quite clearly that all high and significant correlations are centered around the concept of empathy.

2. Analysis of Variance

In order to observe the data from another point of view, an analysis of variance was conducted. In this evolution each of the three independent variables was divided into categories of high, medium, and low. The division categorized the top 25% of the scores in each variable as

TABLE X

MULTIPLE STEPWISE REGRESSION OF RAW DATA

Dependent Variable: Gough Leadership Index

Variable	B	F (Individual)
Hogan Empathy Scale	0.57314	23.97332**
Structure on LOQ	0.09961	1.144
Consideration on LOQ	-0.07609	.633

Constant = 35.64358

F Statistic for regression equation with all three variables included = 8.55171

N = 64

** $p \leq .01$

high, the bottom 25% of the scores in each variable as low and the remaining 50% as medium. This means of division was an arbitrary decision of the researcher. The interest was to subdivide each of the variables in order to better understand the intervariable relationships. Numerous other percentile breakdowns would have been equally valid.

Table XII depicts the results of a multiple stepwise regression conducted on this recategorized data. The resulting regression equation is as follows:

$$L = 4.35824(E) + .61352(S) - 1.10147(C) + 58.94398$$

The results displayed in Table XII show quite clearly the high and statistically significant contribution of empathy in the explanation of leadership. As was the case in the analysis of raw data, Consideration and Structure add little

TABLE XI

INTERVARIABLE PEARSON CORRELATIONS DERIVED IN ANALYSIS OF RAW DATA
(N=64)

	Hogan Empathy Scale	Gough Leadership Index	LOQ Consideration Scale	LOQ Structure Scale
Hogan Empathy Scale		r = .5276 p ≤ .001	r = .4207 p ≤ .001	r = -.3491 p ≤ .002
Gough Leadership Index			r = .1464 p ≤ .124	r = -.0770 p ≤ .273
LOQ Consideration Scale				r = -.1698 p ≤ .090
LOQ Structure Scale				

TABLE XII

MULTIPLE STEPWISE REGRESSION IN ANALYSIS OF VARIANCE

Dependent Variable: Gough Leadership Index

Variable	B	F (Individual)
Hogan Empathy Scale	4.35824	21.42228**
Consideration on LOQ	-1.10147	1.587
Structure on LOQ	.61362	.503

Constant = 58.94398

F Statistic for regression equation with all three variable included = 7.84180

N = 64

** $p \leq .01$

to the regression equation and are statistically insignificant, as is shown by their low F statistics.

A series of Pearson correlations was also conducted on this categorized data and the results compiled in Table XIII. As in the previous research leg, this table contains correlations for all possible combinations of variables.

3. Analysis of Data for Ss Scoring Above the Mean on the Gough Leadership Index

The research hypothesis that these persons high in leadership will also be high in empathy, consideration and structure. In the first of two data manipulations designed to test the hypothesis those Ss scoring above the mean on the Gough Leadership Index were drawn from the sample and subjected to the stepwise multiple regression and the series of Pearson correlations. The significant results of these

TABLE XIII

INTERVARIABLE PEARSON CORRELATIONS DERIVED IN ANALYSIS OF VARIANCE
(N=64)

	Hogan Empathy Scale	Gough Leadership Index	LOQ Consideration Scale	LOQ Structure Scale
Hogan Empathy Scale		r = .5068 p ≤ .001	r = .4338 p ≤ .001	r = -.4338 p = ≤.001
Gough Leadership Index			r = .0962 p ≤ .225	r = -.1532 p ≤ .113
LOQ Consideration Scale				r = -.1667 p ≤ .094
LOQ Structure Scale				

operations are provided in Tables XIV and XV. The equation resulting from the multiple stepwise regression is:

$$L = .09466(E) + .09957(S) + .03483(C) + 51.56089$$

In this data manipulation the sample size was decreased by over 40% thus reducing the degrees of freedom within the statistical analysis and thereby increasing the required value of the F statistic to achieve significance. The F statistics for each of the variables is well below a level of significance.

TABLE XIV

MULTIPLE STEPWISE REGRESSION IN ANALYSIS OF DATA FOR Ss SCORING ABOVE THE MEAN ON GOUGH LEADERSHIP INDEX

Dependent Variable: Gough Leadership Index

Variable	B	F (Individual)
Structure on LOQ	.09957	2.252
Hogan Empathy Scale	.09466	1.491
Consideration on LOQ	.03483	.333

Constant = 51.56089

F Statistic for regression equation with all three variables included = 1.35199

N = 38

TABLE XV

INTERVARIABLE CORRELATIONS DERIVED IN ANALYSIS OF Ss SCORING ABOVE MEAN OF GOUGH LEADERSHIP INDEX (N=38)

	Hogan Empathy Scale	Gough Leadership Index	LOQ Consideration Scale	LOQ Structure Scale
Hogan Empathy Scale		r = .1989 p ≤ .116	r = .442 p ≤ .003	r = -.1937 p ≤ .122
Gough Leadership Index			r = .1290 p ≤ .220	r = .1970 p ≤ .118
LOQ Consideration Scale				r = -.2529 p ≤ .063
LOQ Structure Scale				

4. Analysis of Data for Ss Scoring Greater than One Standard Deviation Above the Mean on the Gough Leadership Index

The final data manipulation was concerned with those Ss scoring greater than one standard deviation above the mean for the group tested on the Gough Leadership Index. As was the case in the previous analysis, the interest was to further test the research hypothesis by more rigidly defining high performance on the leadership scale. The results of the multiple stepwise regression and series of Pearson correlations conducted on the data are provided in Tables XVI and XVII.

The resulting equation for the multiple stepwise regression is:

$$L = .12822(S) + .11163(E) - .05878(C) + 57.30733$$

It should be noted that in this data manipulation the sample

TABLE XVI

MULTIPLE STEPWISE REGRESSION IN ANALYSIS OF DATA FOR Ss SCORING GREATER THAN ONE STANDARD DEVIATION ABOVE THE MEAN ON GOUGH LEADERSHIP INDEX

Dependent Variable: Gough Leadership Index

Variable	B	F (Individual)
Structure on LOQ	.12811	2.63679
Hogan Empathy Scale	.11163	.187
Consideration on LOQ	-.05878	.681

Constant = 57.30733

F Statistic for regression equation with all three variables included = 1.102146

N = 9

TABLE XVII

INTERVARIABLE CORRELATIONS DERIVED IN ANALYSIS OF Ss SCORING GREATER THAN ONE STANDARD DEVIATION ABOVE THE MEAN ON THE GOUGH LEADERSHIP INDEX (N=9)

	Hogan Empathy Scale	Gough Leadership Index	LOQ Consideration Scale	LOQ Structure Scale
Hogan Empathy Scale		$r = .2592$ $p \leq .250$	$r = .5881$ $p \leq .048$	$r = .2201$ $p \leq .285$
Gough Leadership Index			$r = -.2004$ $p \leq .303$	$r = .5223$ $p \leq .075$
LOQ Consideration Scale				$r = -.1434$ $p \leq .356$
LOQ Structure Scale				

size was reduced from sixty-four to nine, a relatively small number.

C. SUMMARY OF RESULTS

Table XVIII shows in composite format the Pearson correlations which were a result of the three phases of the data analysis. In each table, the significant correlations ($p \geq .05$) are highlighted. One exception is also noted, at the .075 level of significance, in which a high positive correlation between leadership and "Initiating Structure" existed for those individuals scoring greater than one standard deviation above the mean on the Gough Leadership Index. These significantly high correlations exist almost exclusively with the dimension of empathy. In all four levels of data analysis, empathy was highly and significantly correlated with "Consideration" and in the analysis of raw data and analysis of variance phases empathy was also highly and significantly correlated with both leadership and "Initiating Structure."

A second composite representation appears in Table XIX which shows the regression equations for the four different handlings of the data. The extremely low equation F statistics for the regression equation resulting from the analysis done on the data of Ss scoring greater than the mean and greater than one standard deviation above the mean on the Gough Index indicates the insignificance of that equation and its inability to be effectively employed as a predictor. However, the equation F statistics for the other two equations are significantly high to warrant their acceptance.

TABLE XVIII

COMPOSITE OF PEARSON CORRELATIONS OVER FOUR PHASES OF DATA ANALYSIS

(A)	LOQ Consideration	LOQ Structure	Hogan Empathy	Data Analyzed
Gough Leadership	r= .1464 p≤ .124	r=-.0770 p≤ .273	r=.5276 p≤.001	All raw data (N=64)
Gough Leadership	r= .0962 p≤ .225	r=-.1532 p≤ .113	r=.5068 p≤.001	Analysis of variance (Raw data recategorized) (N=64)
Gough Leadership	r= .1290 p≤ .220	r= .1970 p≤ .118	r=.1989 p≤.116	Ss ≥ mean on Gough Index (N=38)
Gough Leadership	r=-.2004 p≤ .303	r= .5223 p≤ .075	r=.2592 p≤.250	Ss ≥ 1 Std Dev above mean on Gough Index (N=9)

(B)	Hogan Empathy	LOQ Structure	Data Analyzed
LOQ Consideration	r= .4297 p≤ .001	r=-.1698 p≤ .090	All raw data (N=64)
LOQ Consideration	r= .4338 p≤ .001	r=-.1667 p≤ .094	Analysis of variance (Raw data recategorized) (N=64)
LOQ Consideration	r= .4422 p≤ .003	r=-.2529 p≤ .063	Ss ≥ mean on Gough Index (N=38)
LOQ Consideration	r= .5881 p≤ .048	r=-.1434 p≤ .356	Ss ≥ 1 Std Dev above mean on Gough Index (N=9)

TABLE XVIII (Continued)

(C)	Hogan Empathy	Data Analyzed
LOQ Structure	r=-.3491 p≤ .002	All raw data (N=64)
LOQ Structure	r=-.4338 p≤ .001	Analysis of variance (Raw data recategorized)
LOQ Structure	r=-.1937 p≤ .122	Ss ≥ mean on Gough Index (N=64)
LOQ Structure	r= .2201 p≤ .285	Ss ≥ 1 Std Dev above mean on Gough Index (N=9)

TABLE XIV

REGRESSION EQUATIONS FOR EACH LEVEL OF DATA ANALYSIS

Equation	Equation F Statistic	Level of Data Analysis
L=.57314(E)+.09961(S)-.07609(C)+35.64358	8.55171**	All Raw Data
L=4.35824(E)+.61362(S)-1.10147(C)+58.94398	7.84180**	Analysis of Variance
L=.09466(E)+.09957(S)+.03483(C)+51.56089	1.35199	Ss $\geq$ Mean on Gough Index
L=.12811(S)+.11163(E)-.05878(C)+57.30733	1.102146	Ss $\geq$ 1 Standard Deviation Above Mean on Gough Index

** $p \leq .01$

IV. DISCUSSION

The major focus of this research effort has been to obtain a better appreciation for the concept of leadership through the development and testing of a leadership effectiveness model. Recall that the experimental hypothesis which sired the model was intimately concerned with the notions of leader information, receivers, and transmitters. The receiver elements were technical-administrative knowledge and empathy. Technical-administrative knowledge was considered a constant in the project while empathy was defined as "a sensitivity to the needs and values of others." Consideration and Initiating Structure comprised the transmitter elements and are redefined as follows:

Consideration: Reflects the extent to which an individual is likely to have job relationships characterized by mutual trust, respect for subordinate's ideas, and consideration for their feelings.

Initiating Structure: Reflects the extent to which an individual is likely to define and structure his role and those of his subordinates toward goal attainment.

The receiver and transmitter elements of the leadership effectiveness model relate in an interesting manner. The receiver elements of technical-administrative knowledge and empathy provide the leader with a base of information about his environment. It is upon this information that the

leader must base his decision. Thus, the more sensitive the leaders' receivers the better information will be available to him for decision making. Complimenting the receiver notion is the notion of information transmitters. Here, Consideration and Initiating Structure are the expressive means by which a leader guides the actions of others. It is through the timely and judicious use of these independent leadership transmitter elements that the ultimate fate of a task is determined. The compatibility and complimentarity of the receiver and transmitter notions makes their value in the leadership effectiveness model noteworthy.

Of great interest has been an evaluation of those persons scoring high on the leadership scale, as well as an evaluation of the test group in general. The reason for the particular interest in the high leadership scores is a desire to understand how other proposed faculties, qualities, etc., contribute to what has been determined to be an individual high in leadership.

The analysis of data took the forms of regression analysis and Pearson correlations. The regression analysis attempted to explain the dependent variable, leadership, in terms of the independent variables of empathy, Consideration and Initiating Strucutre. The Pearson correlations took a different tack in contributing to the study. In this leg of the analysis, all possible intervariable relationships were investigated on a one-to-one basis. Each of the two methods added to the understanding of the leadership

phenomenon and the testing of the leadership effectiveness model by approaching the analysis of the data in slightly different manners. Each of the four unique sets of data were subjected to both methods of statistical observation and their individual results displayed in the previous section in Tables X through XVII. The composite results of significant findings are summarized in Tables XVIII and XIX and will be the prime source of information in this section.

Table XIX shows the regression equations for each of the four levels of data analysis. The two equations derived from the analysis of data from Ss scoring high in leadership were statistically insignificant and thus of little research value. A prime cause for this statistical insignificance was the very limited size of these unique samples. A larger sample space may well have added greatly to the results. The two regression equations derived from separate uses of the entire data bank did, however, prove to be statistically significant as can be seen by their high F values. Reference to Tables X and XII in the findings section show that this is probably due primarily to the contribution of empathy. Empathy, therefore, appears to be a significant and reliable predictor of leadership. This finding supports the portion of the hypothesis stating that persons high in leadership will be high in empathy. The common authorship of the base instrument for the leadership index and the empathy scale is also recognized as possibly contributing to the results. The evidence from this study supports the contention that

those individuals high in leadership have better information receivers and are more in tune with the concerns of their subordinates. They would thus appear to base their leadership decisions on more extensive and more accurate information. The individual F values for the other two independent variables of Consideration and Initiating Structure are statistically insignificant and thus their predictive contribution is negligible when compared to that of empathy. Upon reviewing the high and statistically significant correlations between empathy and Consideration and empathy and Structure, it appears that a more meaningful way of phrasing the previous statement is to say that empathy is explaining a portion of leadership which also includes Consideration and Structure.

Pearson correlations between leadership and Consideration were low and statistically insignificant. This would indicate that they therefore added nothing positive to the support of the research hypothesis and the leadership effectiveness model. This lack of direct support for the hypothesis inspired closer examination of indirect relationships. Table XVIII(B) shows a high positive correlation between empathy, a previously demonstrated predictor of leadership, and Consideration. The effect of this seems to positively uphold the hypothesis by indirectly showing that those high leadership individuals will be high in Consideration as well as empathy. This is by no means an unexpected result, because it may be assumed that, individuals high in

leadership, possessing a well tuned receiver in the form of high empathy, are more greatly aware of their environment and thus more capable of demonstrating Consideration as the situation demands. This appears to add further support for the leadership effectiveness model.

Regression equation and Pearson correlation results lend support directly and indirectly to two portions of the hypothesis, i.e. that individuals high in leadership will also be high in empathy and high in Consideration. The final phase of this discussion requires an element of statistical projection for the hypothesis also predicted that those individuals scoring high in leadership would also score high in Structure. Table XVIII(A) shows a high positive correlation between leadership and Structure at the moderate .075 level of significance for very high scorers in leadership. Supporting this single result is a pattern that develops when analyzing the Structure-leadership and the Structure-empathy correlations of Tables XVIII(A) and (C) respectively. Addressing first the Structure-leadership correlations of Table XVIII(A), it is apparent that when considering all of the data inputs a very low negative correlation exists between leadership and Structure. As the groups analyzed become progressively higher in leadership scores, however, this negative correlation between Structure and leadership eventually changes and becomes positive and significant. Thus, at the high end of leadership, Structure is significant and positively related. In a like manner in

Table XVIII(C), a similar phenomenon occurs in that significant negative correlations between Structure and empathy alter sign and become positive as the group analyzed becomes more selective and leadership scores become higher. The net benefit of this pattern analysis is to demonstrate the sensitivity of the measure, Initiating Structure, and to support the third leg of the research hypothesis that those individuals high in leadership would also be high in Initiating Structure. Though based on this indirect evidence and small sample, one might infer that those individuals identified as high in Structure will be high in empathy, a significant predictor of leadership. Again, these findings should be of no real surprise. The inherent task of a successful leader is to guide the actions of a group toward a specified goal. Thus, Initiating Structure, would appear to be a contributing transmitter element in an analysis of the concept of leadership. It describes an expressive means by which those high in leadership accomplish their objectives.

To recapitulate briefly, it appears the hypothesis, that those individuals high in empathy, Consideration and Initiating Structure will also be high in leadership, has met with a measure of success. Additionally, the project has succeeded in effectively evaluating the significance of the reception and transmission elements of the model in explaining the leadership phenomenon. The concepts of administrative and technical knowledge, empathy, Consideration and Initiating Structure are by no means the only variables

entertained in the investigation of leadership but appear to comprehensively address the demands of the receiver-transmitter model.

V. CONCLUSION

The development and refining of leadership research has proceeded at a shamefully slow pace. The techniques of experimental and quasi-experimental design so vital to the success of the physical sciences have only relatively recently found acceptance in the social sciences. Realizing this fact, the research effort has not been geared toward making an addition to the plethora of one shot case studies and scenarios of participant observation which have little relation to other work in the field. The intent was to develop and test a model, employing and integrating valid and reliable psychological instruments, in an effort to explain the interrelationships which exist. It seems fair to conclude that much of this has been done.

The results of this study open several possible avenues for further research. First, and foremost, is a replication of this research project employing a larger sample which would thus yield more stable and hopefully statistically more significant data. Second, a replication of this project might be undertaken using measures other than the Gough Leadership Index as a dependant variable. Finally, the correlations with the concept of empathy that were so significant in this project are a cause for academic curiosity and further research.

Research into the concept of leadership is one of the most vital undertakings facing academic institutions, corporations and governments today. The development of a sound and basic understanding of what constitutes effective leadership and what causes this valued phenomenon is a logical prerequisite for the development of future leaders.

APPENDIX A

TABLE I

Consideration Score on LOQ

VALUE	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY (PERCENT)	ADJUSTED FREQUENCY (PERCENT)	CUMULATIVE ADJ FREQ (PERCENT)
38.00	1	1.6	1.6	1.6
42.00	1	1.6	1.6	3.1
44.00	2	3.1	3.1	6.3
45.00	1	1.6	1.6	7.8
46.00	7	10.9	10.9	18.8
47.00	1	1.6	1.6	20.3
48.00	2	3.1	3.1	23.4
49.00	3	4.7	4.7	28.1
50.00	8	12.5	12.5	40.6
51.00	4	6.3	6.3	46.9
52.00	1	1.6	1.6	48.4
53.00	5	7.8	7.8	56.3
54.00	4	6.3	6.3	62.5
55.00	4	6.3	6.3	68.8
56.00	2	3.1	3.1	71.9
57.00	3	4.7	4.7	76.6
58.00	2	3.1	3.1	79.7
59.00	5	7.8	7.8	87.5
61.00	2	3.1	3.1	90.6
62.00	3	4.7	4.7	95.3
66.00	1	1.6	1.6	96.9
67.00	2	3.1	3.1	100.0
TOTAL	64	100.0	100.0	100.0

MEAN	52.875	MEDIAN	52.700
MODE	50.000	STD DEV	6.153

TABLE II

Initiating Structure Score on LOQ

VALUE	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY (PERCENT)	ADJUSTED FREQUENCY (PERCENT)	CUMULATIVE ADJ FREQ (PERCENT)
34.00	1	1.6	1.6	1.6
35.00	1	1.6	1.6	3.1
37.00	1	1.6	1.6	4.7
38.00	1	1.6	1.6	6.3
39.00	4	6.3	6.3	12.5
40.00	1	1.6	1.6	14.1
41.00	1	1.6	1.6	15.6
42.00	1	1.6	1.6	17.2
43.00	1	1.6	1.6	18.8
45.00	3	4.7	4.7	23.4
46.00	2	3.1	3.1	26.6
47.00	9	14.1	14.1	40.6
48.00	4	6.3	6.3	46.9
49.00	6	9.4	9.4	56.3
50.00	5	7.8	7.8	64.1
51.00	5	7.8	7.8	71.9
52.00	3	4.7	4.7	76.6
53.00	3	4.7	4.7	81.3
54.00	3	4.7	4.7	85.9
56.00	3	4.7	4.7	90.6
57.00	2	3.1	3.1	93.8
58.00	3	4.7	4.7	98.4
61.00	1	1.6	1.6	100.0
TOTAL	64	100.0	100.0	100.0

MEAN	48.453	MEDIAN	48.833
MODE	47.000	STD DEV	5.963

TABLE III

Hogan Empathy Score

VALUE	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY (PERCENT)	ADJUSTED FREQUENCY (PERCENT)	CUMULATIVE ADJ FREQ (PERCENT)
28.00	1	1.6	1.6	1.6
29.00	1	1.6	1.6	3.1
30.00	1	1.6	1.6	4.7
31.00	3	4.7	4.7	9.4
32.00	6	9.4	9.4	18.8
33.00	1	1.6	1.6	20.3
34.00	3	4.7	4.7	25.0
35.00	1	1.6	1.6	26.6
36.00	3	4.7	4.7	31.3
37.00	4	6.3	6.3	37.5
38.00	3	4.7	4.7	42.2
39.00	2	3.1	3.1	45.3
40.00	6	9.4	9.4	54.7
41.00	6	9.4	9.4	64.1
42.00	3	4.7	4.7	68.8
43.00	6	9.4	9.4	78.1
44.00	4	6.3	6.3	84.4
45.00	4	6.3	6.3	90.6
46.00	3	4.7	4.7	95.3
47.00	1	1.6	1.6	96.9
48.00	2	3.1	3.1	100.0
TOTAL	64	100.0	100.0	100.0

MEAN	39.016	MEDIAN	40.000
MODE	32.000	STD DEV	5.242

TABLE IV

Gough Leadership Index

VALUE	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY (PERCENT)	ADJUSTED FREQUENCY (PERCENT)	CUMULATIVE ADJ FREQ (PERCENT)
45.87	1	1.6	1.6	1.6
46.09	1	1.6	1.6	3.1
48.13	1	1.6	1.6	4.7
48.75	1	1.6	1.6	6.3
49.58	1	1.6	1.6	7.8
50.30	1	1.6	1.6	9.4
51.20	1	1.6	1.6	10.9
52.05	1	1.6	1.6	12.5
52.88	1	1.6	1.6	14.1
54.52	1	1.6	1.6	15.6
55.16	1	1.6	1.6	17.2
55.52	1	1.6	1.6	18.8
55.87	1	1.6	1.6	20.3
56.00	1	1.6	1.6	21.9
56.28	1	1.6	1.6	23.4
56.38	1	1.6	1.6	25.0
56.39	1	1.6	1.6	26.6
56.42	1	1.6	1.6	28.1
56.58	1	1.6	1.6	29.7
56.70	1	1.6	1.6	31.3
56.70	1	1.6	1.6	32.8
57.00	1	1.6	1.6	34.4
57.05	1	1.6	1.6	35.9
57.74	1	1.6	1.6	37.5

58.00	1	1.6	1.6	39.1
58.54	1	1.6	1.6	40.6
58.81	1	1.6	1.6	42.2
58.94	1	1.6	1.6	43.8
59.07	1	1.6	1.6	45.3
59.10	1	1.6	1.6	46.9
59.55	1	1.6	1.6	48.4
59.68	1	1.6	1.6	50.0
59.89	1	1.6	1.6	51.6
59.93	1	1.6	1.6	53.1
60.15	1	1.6	1.6	54.7
60.21	1	1.6	1.6	56.3
60.26	1	1.6	1.6	57.8
60.31	1	1.6	1.6	59.4
60.37	1	1.6	1.6	60.9
60.65	1	1.6	1.6	62.5
61.70	1	1.6	1.6	64.1
61.96	1	1.6	1.6	65.6
61.96	1	1.6	1.6	67.2
62.00	1	1.6	1.6	68.8
62.08	1	1.6	1.6	70.3
62.10	1	1.6	1.6	71.9
62.21	1	1.6	1.6	73.4
62.22	1	1.6	1.6	75.0
62.31	1	1.6	1.6	76.6
62.42	2	3.1	3.1	79.7
62.64	1	1.6	1.6	81.3

62.84	1	1.6	1.6	82.8
63.09	1	1.6	1.6	84.4
63.26	1	1.6	1.6	85.9
63.99	1	1.6	1.6	87.5
64.28	1	1.6	1.6	89.1
64.34	1	1.6	1.6	90.6
64.38	1	1.6	1.6	92.2
64.63	1	1.6	1.6	93.8
64.79	1	1.6	1.6	95.3
65.71	1	1.6	1.6	96.9
65.76	1	1.6	1.6	98.4
67.99	1	1.6	1.6	100.0
TOTAL	64	100.0	100.0	100.0

MEAN	58.808	MEDIAN	59.784
MODE	62.423	STD DEV	4.916

BIBLIOGRAPHY

1. Ashour, Ahmed Sakr and England, George, "Subordinates Assigned Level of Discretion as a Function of Leaders Personality and Situational Variables," Journal of Applied Psychology, v. 56, no. 2, p. 120-123, 1972.

2. Bass, Bernard M., "Leadership Opinions as Forecast of Supervisory Success," The Journal of Applied Psychology, v. 40 no 5, p. 345-346, 1956.

3. Bass, Bernard M., "Leadership Opinions as Forecast of Supervisory Success: A Replication," Personnel Psychology, p. 515-518, 1958.

4. Black, J. D. Test of Social Insight, Reviewed in O. K. Buros, Jr. (Ed). Sixth Mental Measurements Yearbook Gryphon, 1965.

5. Bordin, E. S., Test of Social Insight Reviewed in Journal of Consulting Psychology, v. 24, 1960.

6. Cassell, R. N., Test of Social Insight (Rev.Ed), Bruce, 1963.

7. Cronbach, Lee J., "Processes Affecting Scores on "Understanding of Others" and Assumed Similarity," Psychological Bulletin, v. 52 no 3, p. 177-193, May 1955.

8. Dymond, R. A., "A Preliminary Investigation of the Relation of Insight and Empathy," Journal of Consulting Psychology, v. 12, 228-233, 1948.

9. Dymond, R. A., "Personality and Empathy," Journal of Consulting Psychology, v. 14, p. 343-350, 1950.

10. Dymond, R. A., "A Scale for the Measurement of Empathetic Ability," Journal of Consulting Psychology, v. 13, p. 127-133, 1949.

11. Fleishman, Edwin A., Manual for Leadership Opinion Questionnarie, Science Research Associates, Inc., 1969.

12. Gage, N. L. and Cronbach, Lee J.,"Conceptual and Methodological Problems in Interpersonal Perception," Psychological Review, v. 62, no. 6, p. 411-422, 1955.

13. Gough, Harrison G., "A Leadership Index on the California Psychological Inventory," Journal of Counseling Psychology, v. 16, no. 4, p. 283-289, 1969.

14. Gough, H. G., "A Validation Study of the Chapin Social Insight Test," Psychological Reports, V. 17, p. 355-368, 1965.

15. Gough, Harrison G., Manual for the California Psychological Inventory, Consulting Psychologists Press, Inc., 1969.

16. Gouldner, A. (ed), Studies in Leadership, Harper, 1950.

17. Grief, Esther Blank and Hogan, Robert, "The Theory and Measurement of Empathy," Journal of Counseling Psychology, v. 20, no. 3, p. 280-284, 1973.

18. Hall, W. B., The Empathy Test. Reviewed in O.K. Buros, Jr (ed), Sixth Mental Measurements Yearbook, Gryphon Press, 1965.

19. Hall, Harry S., and Bell, Graham B., "The Relationship Between Two Tests of Empathy: Dymonds and Kerr's," American Psychologist v. 8, p. 361-362, 1953.

20. Hastorf, A. H. and Bender, I. E., "A Caution Respecting the Measurement of Empathetic Ability," Journal of Abnormal Social Psychology, v. 47, p. 574-576, 1952.

21. Hatch, Richard S., An Evaluation of a Force-Choice Differential Accuracy Approach to the Measurement of Supervisory Empathy, Prentice-Hall, 1962.

22. Hogan, Robert, "Development of an Empathy Scale," Journal of Consulting and Clinical Psychology, v. 33, no. 3, p. 307-316, 1969.

23. Kerr, W. A., "The Empathy Test," Chicago: Psychometric Affliates, 1947.

24. Korman, Abraham K., "Consideration," Initiating Structure" and Organizational Criteria - A Review," Personnel Psychology, v. 19, no. 4, p. 349-361, Winter, 1966.

25. Newport, Gene, "A Study of Attitudes and Leader Behavior," Personnel Administration, v. 25(2), p. 42-46, 1962.

26. Sanford, Fillmore H., Current Trends: Psychology in the World Emergency, University of Pittsburgh Press, 1952.

27. Stogdill, Ralph J. and Coons, Alvin E., Leadership Behavior: Its Description and Measurement, Bureau of Business Research, College of Commerce and Administration, Ohio State University, 1957.

28. Stogdill, R., "Personal Factors Associated with Leadership: A Review of the Literature," Journal of Psychology, v. 25, p. 35-71, 1948.

29. Thorndike, R. L., The Empathy Test Reviewed in O.K. Buros, Jr. (ed), Fifth Mental Measurements Yearbook, Gryphon Press, 1959.

30. Yukl, Gary, "Toward a Behavioral Theory of Leadership," Organizational Behavior and Human Performance, v. 6, p. 414-440, 1971.

ADDITIONAL BIBLIOGRAPHY

1. Adorno, T. W. and others, The Authoritarian Personality, Harper and Row, 1950.

2. Bass, Bernard M., Leadership Psychology and Organizational Behavior, Harper and Bros., 1960.

3. Campbell, John P. and others, Managerial Behavior, Performance, and Effectiveness, McGraw Hill, 1970.

4. Costello, Timothy W. and Zalkind, Sheldon S., Psychology in Administration: A Research Orientation, Prentice-Hall, 1963.

5. Cronbach, Lee J. and Goldine C. Gleser, "Assessing Similarity Between Profiles," The Psychological Bulletin, v. 50, no. 6, p. 456-473, 1953.

6. Gage, N. L. and Evline, Ralph V., "Social Perception and Effectiveness in Discussion Groups," Human Relations, p. 381-396, 1953(6).

7. Greer, F. Loyal, "Interpersonal Knowledge and Individual and Group Effectiveness," Journal of Abnormal Social Psychology, v. 49, p. 411-414, 1954.

8. Guion, Robert M., Personnel Testing, McGraw Hill, 1965.

9. Haire, Mason, Ghiselli, Edwin E., and Porter, Lyman W., Managerial Thinking: An International Study, Wiley, 1966.

10. Heider, Fritz, The Psychology of Interpersonal Relations, Wiley, 1958.

11. Katz, Daniel and Kann, Robert, The Social Psychology of Organizations, Wiley, 1966.

12. Knowles, William H., "Human Relations in Industry: Research and Concepts," California Management Review, p. 87-105, Fall 1958.

13. Korman, Abraham K., "Self-Esteem Variable in Vocational Choice," Journal of Applied Psychology, v. 50, no. 6, p. 479-486, 1966.

14. McMurry, Robert N., "The Case for Benevolent Autocracy," Harvard Business Review, v. 36(1), p. 82-90, 1958.

15. Megargee, Edwin Inglee, The California Psychological Inventory Handbook, Jossey-Bass, 1972.

16. Nagle, Bryant F., "Productivity, Employee Attitude, and Supervisor Sensitivity," American Psychologist, v. 8, p. 408, 1953.

17. Olmsted, Michael S., The Small Group, Random House, 1959.

18. Sales, Stephen M., "Supervisory Style and Productivity: Review and Theory," Personnel Psychology, v. 19, no. 3, p. 275-286, Autumn, 1966.

19. Schenfeld, Erwin, "Authoritarian Management: A Reviving Concept?" Personnel, v. 36(1), p. 21-24, 1959.

20. Taguiri, Renato, Blake, Robert R., and Bruner, Jerome S., "Some Determinants of the Perception of Positive and Negative Feelings in Others," The Journal of Abnormal and Social Psychology, v. 48, no. 4, p. 585-592, 1953.

21. Tagiuri, Renato and Petruilo, Luigi, Person Perception and Interpersonal Behavior, Stanford University Press, 1958.

22. Talland, George A., "The Assessment of Group Opinion by Leaders, and their Influence on its Formation," Journal of Abnormal Social Psychology, v. 49, p. 431-434, 1954.

23. Titus, Edwin H., and Hollander, E. P., "The California F Scale in Psychological Research: 1950-1955," Psychological Bulletin, vol. 54, no. 1, p. 47-64, 1957.

24. Truax, Charles B., and others, "Theapist Empathy, Genuineness, and Warmth and Patient Therapeutic Outcome," Journal of Consulting Psychology, V. 30, no. 5, p. 395-401, 1966.

INITIAL DISTRIBUTION LIST

		No. Copies
1.	Defense Documentation Center Cameron Station Alexandria, Virginia 22314	2
2.	Library, Code 0212 Naval Postgraduate School Monterey, California 93940	2
3.	Department Chariman, Code 55 Department of Operations Research and Administrative Sciences Naval Postgraduate School Monterey, California 93940	1
4.	Professor T. A. Wyatt Department of Operations Research and Administrative Sciences Naval Postgraduate School Monterey, California 93940	1
5.	Professor John Senger Department of Operations Research and Administrative Sciences Naval Postgraduate School Monterey, California 93940	1
6.	Dr. G. Mann Management-Leadership Department U.S. Naval Academy Annapolis, Maryland 21412	1
7.	LT J. H. Quinlan 25 Highlands Avenue Springfield, New Jersey 07081	1